

Information Processing Apparatus, Management Control
Method, Computer Program And Memory Medium

BACKGROUND OF THE INVENTION

5 Field of the Invention

The present invention relates to an apparatus, a
system, a method, a medium and a program for user
support such as inventory management, order
management etc. of an expendable to be used in an
10 electronic equipment such as an office equipment
connected to a network.

Related Background Art

In the office automation equipment such as the
printer or the copying apparatus, there has been
15 executed to detect the consumption of an expendable
such as recording paper or toner by a predetermined
amount at the equipment and to automatically place an
order through a network or the like.

However, in case plural equipment are used for
20 example in an office, the expendables corresponding
to such equipment may be of different types. On the
contrary, there is also assumed a case where the
plural equipment may require different repairing
works but use expendables of a same type. In such
25 cases, the management is in fact required for each
expendable used in each equipment.

Also the equipment of plural types can be

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generally classified into two types, namely those of device type, such as a printer, connected to a personal computer (PC), and those of PC/server type such as a personal computer (PC). However the
5 equipment of these two types have respective specific error information, option information etc. and such information is difficult to manage in unified manner and have been managed individually.

On the other hand, the works relating to the
10 expendable such as delivery, financing, recovery of expendable are not linked and have been executed inefficiently.

Particularly in case an expendable is ordered and the delivery of a new expendable to the customer
15 is instructed but such delivery is not executed soon, it has not been possible to achieve prompt response.

In consideration of the foregoing, the object of the present invention is to enable, in case the electronic equipment of plural types are used for
20 example in an office, the inventory management and order for each type of expendable corresponding to each electronic equipment.

SUMMARY OF THE INVENTION

25 The above-mentioned object can be attained, according to the present invention, by the following configuration.

There is provided an information processing apparatus for acquiring, from a peripheral device management apparatus for managing information specific to a peripheral device connected through a local area network, information specific to the
5 aforementioned peripheral device through an external network, and, from a general-purpose computer management apparatus for managing information specific to a general-purpose computer connected
10 through the aforementioned local area network, information specific to the aforementioned general-purpose computer through the aforementioned external network thereby executing unified management of the aforementioned peripheral device and the
15 aforementioned general-purpose computer, comprising discrimination means for discriminating whether information received through the aforementioned external network is information specific to the peripheral device or information specific to the
20 general-purpose computer, specifying means for specifying, in case the information received through the external network is discriminated as information specific to the peripheral device and indicating absence of inventory by the discrimination means,
25 information for specifying expendable contained in the aforementioned information indicating the absence of inventory, and information and information for

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identifying the user constituting the owner of the
expendable of which inventory is absent, and display
control means for causing a predetermined display
unit to display the type of the expendable specified
5 by the specifying means and the information for
identifying the user.

In a preferred embodiment, there is further
provided instruction means for instructing, to a
distribution server communicable through the external
10 network, the delivery of the expendable of a type
specified by the specifying means to a destination
based on the information of the aforementioned user.

Also in a preferred embodiment, the
aforementioned user information includes the e-mail
15 address for communication and there is further
provided confirmation mail informing means for
informing the aforementioned e-mail address of a
confirmation mail for instructing the delivery of the
expendable of the type of which inventory is absent,
20 as specified by the specifying means.

Also in a preferred embodiment, there is further
provided alarm means, after the delivery instruction
is issued by the instruction means, for giving an
alarm through the external network to the
25 aforementioned distribution server or to a portable
terminal assigned to a person in charge of delivery,
in response to the reception of information

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indicating the absence or decrease of inventory of the expendable of the type specified by the specifying means.

Also in a preferred embodiment, the
5 aforementioned information indicating the absence of
inventory includes information indicating the
remaining quantity of inventory of the aforementioned
expendable.

Also in a preferred embodiment, the acquisition means includes first acquisition means for acquiring, through the external network, information on a general-purpose computer connected through the local area network; and second acquisition means for acquiring, through the external network, information specific to the peripheral device connected to the local area network;

wherein the first acquisition means acquires the information on the general-purpose computer in a first format specific to the general-purpose computer, and the second acquisition means acquires the information on the peripheral device in a second format specific to the peripheral device.

Also in a preferred embodiment, there is further provided conversion means for converting the information of the first format, relating to the general-purpose computer and acquired by the first acquisition means into the second format, and the

aforementioned display unit is provided in an apparatus capable of interpreting the second format and is capable of display based on the second format.

Also in a preferred embodiment, there is further
5 provided conversion means for converting the information of the second format, relating to the peripheral device and acquired by the second acquisition means into the first format, and the aforementioned display unit is provided in an
10 apparatus capable of interpreting the first format and is capable of display based on the first format.

Also in a preferred embodiment, there is further provided conversion means for converting the information of the first format, relating to the
15 general-purpose computer and acquired by the first acquisition means and the information of the second format, relating to the peripheral device and acquired by the second acquisition means, into a common third format, and the aforementioned display
20 unit is capable of displaying information based on the third format.

Otherwise there are provided reception means for receiving information of no inventory indicating that the inventory is less than a predetermined number for
25 the expendable of each type to be used in the peripheral device, together with information for specifying the user; and

information means for informing, after a
delivery instruction in response to the reception of
information on the expendable of each type included
in the no inventory information received by the
5 reception means and the information for specifying
the user, an alarm through the external network to a
communication address assigned to a person in charge
of the delivery instruction, in response to the
reception of information indicating absence or
10 decrease of the inventory of the expendable of the
specified type.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram showing the
15 configuration of a managed site and a managing site;

Fig. 2 is a block diagram showing the
configuration of a software module of a remote site
management system;

Fig. 3 is a block diagram showing the
20 configuration of a computer constituting each
personal computer or server;

Fig. 4 is a block diagram showing the data
exchange sequence between a base system and a center
system;

25 Fig. 5 is a flow chart showing the process
sequence at message reception in a device center
server;

Fig. 6 is a flow chart showing the process sequence for an event generated in a device monitor server 203a;

Fig. 7 is a flow chart showing the sequence of message reception of the device monitor server 203a from a device center server 210;

Fig. 8 is a view showing an example of message format exchanged between the device center server 210 and the device monitor server 203a;

Fig. 9 is a block diagram showing the configuration of a software module of a remote site management system embodying the present invention;

Fig. 10 is a flow chart showing the sequence of downloading of set value to a device, to be executed between the base system and the center system;

Fig. 11 is a flow chart showing the sequence of uploading of count data, namely of device information collection, to be executed between the base system and the center system;

Fig. 12 is a flow chart showing the sequence of uploading of log data from the base system to the center system;

Fig. 13 is a flow chart showing the process sequence at an event reception at the center server 110;

Fig. 14 is a flow chart showing the process sequence for a download ending event by a device

information processing module 901;

Fig. 15 is a flow chart showing the process sequence for information of device information acquisition (counter uploading) by the device

5 information processing module 901;

Fig. 16 is a flow chart showing the process sequence for information of log data uploading by the device information processing module 901;

Fig. 17 is a flow chart showing the process sequence for a message or an even issued to a plug-in at a base plug-in 203b;

Fig. 18 is a flow chart showing the process sequence by the base plug-in 203b in response to a message received from a center server 1101;

15 Fig. 19 is a flow chart showing the process sequence in case a PC monitoring client receives a message;

Fig. 20 is a block diagram showing an example of the configuration of a service system;

20 Fig. 21 is a flow chart showing an example of the process sequence executed among a user base system, a center system and a distribution organization;

Fig. 22 is a flow chart showing an example of the process sequence executed among a user base system, a center system, a distribution organization and a financing organization;

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Fig. 26 is a view showing an example of display of a no inventory warning and an order guiding mail;

5 Fig. 27 is a view showing an example of an order
placing image;

Fig. 28 is a view showing an example of display of an approval requesting image;

Fig. 29 is a view showing an example of display
10 of an approving image for an electronic bill;

Fig. 30 is a view showing an example of display of a confirming image showing an approval for an electronic bill;

Fig. 31 is a view showing an example of display
15 of a confirming image showing a denial for an
electronic bill;

Fig. 32 is a view showing the information flow among a user base system, a center system, a distribution organization and a financing organization;

Fig. 33, which is comprised of Figs. 33A and 33B, is a view showing the process flow among a user base system, a center system and a distribution organization:

25 Figs. 34 and 35 are views showing examples of
display of an event monitor image at the center
system.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

(First embodiment of management system)

In the following there will be explained the
5 details of a management system of the present
invention with reference to accompanying drawings.

<System configuration>

Fig. 1 is a block diagram showing the
configuration of a managed site (corresponding to a
10 user base system 2001 in Fig. 20) and a managing site
(corresponding to a center system 2003 in Fig. 20).
The managed site includes a PC 103 constituting a
general-purpose computer, a device monitor server
203a (information equipment for managing devices
15 connected to a local network for example in an
office), and a copying apparatus 101 and printers 105,
104 constituting peripheral devices, all connected by
a LAN. The general-purpose computer includes a
personal computer, a server, a gateway, a router and
20 a network itself, and the peripheral device includes
a copying apparatus, a printer, a scanner, a
facsimile, a compound equipment etc. The PC 103 can
execute a PC monitor client module to be explained
later for managing the general-purpose computer, and
25 can also manage the general-purpose computer devices
connected to the local network for example in an
office. Also the device monitor server 203a and the

PC monitor client server may be physically separate or unified, or may also be logically separate within a physically same apparatus. Though not illustrated in Fig. 1, there may be provided, on the LAN of the managed site, for example a converting device for converting/adjusting the data format between the device monitor server 203a and the PC monitor client module as components of the present invention.

Also in the managing site, there is constructed a LAN system to which connected are a center server 110 for unified management of the device of the managed site, an inventory database 109 for accumulating management information etc., and a device center server 210 for exclusively managing the peripheral devices in the managed site. To such system, there may also be connected another computer such as a server/PC 111, and a managing application program utilizing the management information may be executed by such computer 111.

Also, though not illustrated in Fig. 1, there may be provided, on the managing site, for example a display device for displaying information from the managed site or a converting device for converting/adjusting the data format between the center server 110 and the device center server as components of the present invention.

There may also be included a service center

connected with the managing site through an external network or a LAN and serving to comprehensively managing the managing site.

The managed site and the managing site are mutually connected by gateways 106, 107. The connection may also be made by an ordinary router or a modem. Also in case the PC 103 executes the PC monitor client module, the connection between the PC 103 and the center server 109 may be made independent from the connection between the device monitor server 203a and the device center server 210.

Fig. 3 is a block diagram showing the configuration of a PC or a computer constituting a server. Referring to Fig. 3, a computer 3000 is provided with a CPU 1 for executing a procedure of transmitting designated data to the exterior or of data reception from the exterior based on a communication control program stored in a program ROM of a ROM 3, and the CPU 1 comprehensively controls the devices connected to a system bus 4. A RAM 2 serves as a main memory, a work area etc. of the CPU 1. A keyboard controller (KBC) 5 controls the key input from a keyboard 9 or an unrepresented pointing device. A CRT controller (CRTC) 6 controls the display on a CRT display 10. A memory controller (MC) 7 controls access to an external memory 11 such as a hard disk (HD), a floppy disk (FD) etc. storing

boot programs, various applications, font data, user files, editing files to be explained later, various databases etc. A LAN control unit 8 is connected to the network and executes a communication control
5 process with other devices connected to the network.

Furthermore, there is provided error detection means not shown in Fig. 3, for the purpose of detecting error states such as a full memory capacity of the own apparatus, a deficiency in the HD capacity,
10 a stopping of the operation process etc. The LAN control unit 8 is also provided with a function of transmitting (informing) the detected error information to the device monitor server 203a or a PC monitor client module 203d.

15 In case the error information is transmitted to the center server 110a, it is stored and managed in an inventory database 109.

As in the equipment of PC/server type, the equipment of device type is provided with error
20 detection means for detecting error information such as absence of expendables, absence of paper, end of service life of a photosensitive member etc. There is also provided a function similar to that of the LAN control unit 8 thereby being capable of
25 transmitting the detected information to the device monitor server.

Fig. 2 is a block diagram showing the

configuration of the software module of the present
remote site management system. A user base system
(indicating the managed site) is mixedly provided
with equipment of device type (peripheral devices
5 such as copying apparatus, printer, compound
equipment, scanner, facsimile etc.) and those of
PC/server type (general-purpose computer), but the
equipment of device type and those of PC/server type
are respectively controlled locally by the device
10 monitor server 203a and the PC monitor client 203d.
These constituents are collectively called a base
side management system 203 (corresponding to the user
base system shown in Fig. 2). The device monitor
server 203a is provided with a database 203a-1 for
15 accumulating management information.

On the other hand, a center system (indicating
the managing site) includes a device center server
210 for exchanging data with the device monitor
server 203a, and a center server 110 for exchanging
20 data with the PC monitor client 203d. The management
information of the equipment of device type is
accumulated in the inventory database 109. Also the
management information managed by the center server
is accumulated in the inventory database 109. The
25 management information accumulated in the inventory
database 109 is utilized for example by an
application system 205. The inventory database 109

is only required to be separated logically between the equipment of device type and those of PC/server type but may naturally be separated physically.

The device monitor server 203a and the device
5 center server 210 are connected through a base plug-in module 203b and a server plug-in module for converting the data format and the procedure according to the necessity. Such base plug-in module and server plug-in module enable mutual communication
10 even in case the used OS is different between the base side and the center side. Electrically, the connection is made through a router 204. This channel is physically or logically used in common with a channel connecting the PC monitor client 203d
15 and the center server 110.

The channel connecting the device center server 210 and the device monitor server 230a may not be in common with the channel connecting the monitor client 203d and the center server, and may be connected by a
20 channel through a modem or a router and independent from the channel connecting the management client 203d and the center server 110.

The center server 110 includes an event monitor 110a for monitoring an event issued to the center
25 server 110 and displaying such even on the monitor if such event transmits for example a trouble. By looking at the display, the manager can know the

status of the trouble generated in the managed site.
The event to the center server 110 may be issued from
an event adaptor 210a, the PC monitor client 203d or
the application system 205. The center server 110
5 executes a predetermined process according to the
content of the received event. The event can be, for
example, an information for a trouble.

The device center server 210 includes an event
adaptor module 210a. The event adaptor module 210a
10 has a function of periodically searching the
information transmitted from the device monitor
server 203a to the device center server 210, and
discriminates information on the trouble generated in
the peripheral device among the searched information,
15 converts such information into a format (file format,
protocol format etc.) processable in the center
server 110 and issues an event indicating the
generation of trouble to the center server 110.
Otherwise, the function of the event adaptor module
20 210a of conversion into the format processable by the
center server may be provided in the center server
110. The event relating to the trouble (trouble
event) includes a device showing the trouble, the
content thereof, time of generation thereof etc. The
25 presence of the event adaptor 210a in the present
system or present apparatus allows unified management
of the information specific to the device, such as

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paper jamming, absence of expendable such as ink/toner, absence of paper, end of service life of the photosensitive member (including photosensitive member unit) and checking of stapling function, obtained by a management software utilizing a protocol/format designed exclusively for the device, by means of a software for monitoring the system/apparatus of another type (general-purpose computer or server in the present embodiment).

Also the information generated in the equipment of PC/server type, managed by the PC monitor client 203d and informed to the center server 110 includes for example the use rate of CPU, usable number of bytes of the memory, percentage of use of the page file, and empty area of the logical disk (empty area of HD), and such information is managed as the information specific to the equipment of PC/server type obtained by a management software utilizing the protocol/format assumed exclusively for the equipment of PC/server type. In the equipment of PC/server type, for example the HD is managed as an expendable.

In response to such information, the event monitor 110a displays the device showing such trouble, content thereof, time of generation thereof etc. as an addition to an event list. The display is for example achieved by displaying an event in a line, thereby showing a time-sequential list of the events.

In Fig. 2, the event monitor 110a is included in the center server 110, but it may be connected from the center server 110 to the exterior for example through a network, in order to enable collective management of the equipment of the device and PC/server types from the device center server 210 or from the application system 205.

It is to be noted that the event monitor 110a can call attention of the manager by displaying any trouble event regardless of the origin of such trouble. More specifically, the event monitor 110a can display the trouble event in the general-purpose computer, issued from the PC monitor client 203d and the trouble event in the peripheral device, issued from the device monitor server 203a through the event adaptor 210a of the device center server 210, in an event list on a same image for example time-sequentially.

Further, though not illustrated in Figs. 1 and 2, there exists organization (web server) such as a financing organization or a distribution organization in the network between the user base system and the center system, as will be explained later in more details.

In the following there will be explained, with reference to Fig. 4, the data exchange procedure between the device center server 210 and the device

monitor server 203a, by three examples, i.e. (1)
downloading of set value from the device center
server 210 to a device, (2) uploading of log data
from the device monitor server 203a to the device
5 center server 210, and (3) request for counter data
from the device center server 210 to the device
monitor server 203a. At first there will be briefly
explained the data format.

Fig. 8 shows an example of the format of a
10 message exchanged between the device center server
210 and the device monitor server 203a. A message
includes a flag field, a data type field, a job ID
field, a return value field, a data length field, and
a data field. The flag field includes a bit group
15 indicating communication means and a bit indicating
whether the message is the last frame of data.

The data type field indicates that the data are,
for example, approval requesting data (to be sent at
the head of a session), set value data to be
20 downloaded, a device information request to be
explained later, an event information, or a log
process request. For example, in a trouble
information, event information is indicated in the
data type field and the specific content of the event
25 is indicated in the data field.

The job ID field indicates the type of the
session, including the parameter setting, acquisition

of device information, event information etc. The data length field indicates the length of the ensuing data, and the data field stores data of the length indicated in the data length field. For the set value downloading or the log data process request, corresponding data are placed in the data field. Also in case of the counter uploading, device information is placed in the data field of a response to the device information request.

10 In the following sequence, the device center server 210 and the device monitor server 203a execute the process by exchanging such message. In the following description, "event" means a message for transmitting generation of an event.

15 <Procedure of set value downloading>

Fig. 4 is a block diagram showing the data exchange sequence between the base system and the center system.

The downloading of a set value is executed in the following manner:

- (1) In the application system 205, there are manually entered the designation of a device for setting, the IP address of the device, the threshold set value for the alarm information for an error or the like of the device to the base device server, thereby preparing a set value information file 401;
- (2) The application system 205 establishes a session

with the device center server 210 and transmits the set value data contained in the set value information file 401;

(3) Receiving the set value data, the device center
5 server 210 establishes a session with the device monitor server 203a and transmits thereto the set value data;

(4) Receiving the set value data, the device center
10 server 210 sends the set value to the device. This operation is executed in a procedure determined for each device;

(5) When the device setting is completed, the device monitor server 210 informs the device center server 210 of the end of setting;

15 (6) The device center server 210 informs the application system 205 of the end of setting.

Thereafter the application system 205 releases the session with the device center server 210, and the device center server 210 releases the session
20 with the device monitor server 203a.

In this manner the device set information can be downloaded to the device 402 by the direct communication between the device monitor server 203a and the device center server 210.

25 The trouble is processed in the following manner:

(7) In case the PC monitor client 203d detects any

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trouble in the server or in the PC and issues a trouble event, such event is directly issued to the center server 110;

(8) Also in case the device monitor server 203a
5 detects the aforementioned trouble in the device 402, the information of such trouble is transmitted to the device center server 210;

(9) Receiving the information of the trouble in the device 402, the device center server 210 in response
10 issues an event informing the generation of trouble to the center server 110. The event adaptor 201a in Fig. 2 is included in the device center server 210 shown in Fig. 4, and the trouble event shown in Fig. 4 is issued from the event adaptor 201a;

15 (10) As the event is a trouble event, the event monitor 110a displays the trouble information on an event console, thereby renewing the event list.

As explained in the foregoing, any event informing the trouble passes through the center
20 server 110 regardless whether the trouble is generated in any device or any general-purpose computer in the managed site, so that the manager can monitor the information of all the devices and the general-purpose computer in the managed site by
25 merely watching the event console of the center server. The information displayed on the event console may also be printed or displayed on a

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portable terminal owned by the service personnel.

The printed information may be mailed to a managed person and the information displayed on the portable terminal of the service personnel may be utilized for
5 dispatching thereof.

It is also conceivable, in the present system, to transmit the data displayed on the console to the server of the managed site, utilizing an information communication tool such as e-mail, in the form of
10 statistical data indicating for example time and frequency of errors. For example there can be conceived a configuration in which a file representing statistical data is downloaded or memorized in the database of the device monitor
15 server 203a by the communication sequence explained above and such memorized statistical data are observed by designating the URL in an application such as the web browser on the display of the personal computer of the manager. The present
20 invention further allows to a person of the managed site to observe the statistical data by uploading such statistical data from a service center such as the application system 205 to an external server present on the internet. In this manner, the unified
25 management information for the devices and the general-purpose computer/server may be utilized in various forms.

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the device 402, in order to discriminate whether or not to inform the information from the device side to the center side.

Also the functions of the present invention can
5 be attained by storing the database for the discriminating function whether or not to display the trouble information, informed to the center server 110, on the event console 110b or the database for the discriminating function whether or not to contact
10 the service personnel in any of an application system 209, the inventory database 109 and the center server 110 of the center server side.

The present system has such filtering function associated with the transmission of information,
15 thereby enabling reduction of the traffic amount between the base and the center, and also enabling the manager at the center to clearly and easily recognize the important error information.

<Procedure of counter uploading>

20 The uploading of the counter value, namely the collection of the device information is executed in the following manner. The counter value for example means a value indicating the number of printed pages in the copying apparatus or the printer, or a value
25 of a mode counter indicating the amount of use of various modes of the device, and is used as the basis for calculating the maintenance charge. The

uploading of such value in response to a request from the center system enables fetching of the device information including the counter value, from a remote location. As the counter uploading is

5 executed in response to a request from an application, the center system (managing site) becomes the initiator in the following manner:

(1) The application system 205 establishes a session and transmits a device information request to the
10 device center server 210. The device information request includes for example information designating an object device in the base system;

(2) Receiving the device information request, the device center server 210 establishes a session with
15 the device monitor server 203a and transmits a device information request thereto;

(3) Receiving the device information request, the device monitor server 203a acquires the device information from the designated device. This
20 operation is executed according to a procedure determined for each device, and information determined for each device or designated information is acquired;

(4) Acquiring the device information, the device
25 monitor server 203a transmits a device information response including the acquired device information to the device center server 210;

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(5) The device center server 210 transmits the device information response to the application system 205.

Thereafter the application system 205 releases the session with the device center server 210, and the device center server 210 releases the session with the device monitor server 203a.

In this manner the device information can be acquired by the direct communication between the device monitor server 203a and the device center server 210.

The trouble is handled in the same manner as in the set value downloading.

<Procedure of log data uploading>

The uploading of the log data is executed in the following manner. The log data mean the history of warning or retry generated for example in a peripheral device, and are spontaneously transmitted to the managing site in case a certain abnormal situation not reaching the level of an error, such as repeated warnings, is being generated. Consequently, in the uploading of the log data, in contrast to the uploading of the counter value, the managed site (base system) becomes the initiator as shown in the following:

(1) The device monitor server 203a collects the log of a device. In case the amount of such log exceeds

a predetermined value or the frequency of alarm exceeds a predetermined rate, the device monitor server 203a initiates the uploading of the log data;

(2) At first the device monitor server 203a

5 establishes a session and transmits a log data process request including log data to the device center server 210;

(3) Receiving the log data process request, the device monitor server 203a establishes a session with

10 the device center server 210 and transmits the log data process request thereto;

(4) Receiving the log data process request, the device center server 210 establishes a session with the application system 205 and sends the log data

15 process request to the application system 205 which processes the log data;

(5) Receiving the log data process request, the application system 205 processes the log data received therewith and transmits a log data process

20 response to the device center server 210;

(6) The device center server 210 transmits the log data process response to the device monitor server 203a;

(7) The device monitor server 203a releases the
25 session with the device center server 210 and executes a post process. If the log data response indicates the proper completion of the log data

process, the post process executes erasure of the log data.

Thereafter the device center server 210 releases the session with the application system 205.

5 In this manner the uploading of the log data can be executed by the direct communication between the device monitor server 203a and the device center server 210.

10 The trouble is handled in the same manner as in the downloading of the set value.

<Process sequence by device center server>

15 In the following the process sequences in the device center server 210 and in the device monitor server 203a will be briefly explained. Fig. 5 is a flow chart showing the process sequence of the device center server at the message reception. The message is received not only from the device monitor server but also from the application system 205. The format of the message may be different from that shown in
20 Fig. 8. The message is so constructed as to enable identification of the source of transmission, or the executed process is made different according to the source of transmission. The former is adopted in the present embodiment.

25 The process shown in Fig. 5 is initiated in response to the reception of a message. At first the received message is analyzed (step S501) to identify

the source of issuance thereof (S502). The source of issuance may be indicated for example by the addition of an address or the like, but can also be identified from the content thereof. For example, in case of a
5 log process request, the source of issuance is the device monitor server, and the source of issuance of a set value downloading request is the application system (represented as backend in the flow chart).

If the source of issuance is the device monitor
10 server 203a, there is discriminated whether the message is a trouble event (S503), and, if so, it is converted into a processable format and transferred to the center server 110 (S504). The center server 110 reads and displays the location, content, time
15 etc. of the trouble from the data contained in the message (S505). If not a trouble event, the data are transferred to the backend to execute a process matching the message, whereupon the sequence enters a waiting state for the message. The process
20 transferred to the backend includes, for example, a log data process request and collected device information.

On the other hand, if the source of issuance is the backend, namely the application system, there is
25 discriminated whether the message is a collection request for the device information (S506). If so, a device information collection request is issued to

the device monitor server 203a, whereupon the sequence enters a waiting state for the message.

If not a device information collection request, there is discriminated whether the message is a
5 download request for the set value (S508). If so, the received download information is acquired (S509) and is issued to the device monitor server 203a (S510).

<Process sequence by device monitor server>

10 Fig. 6 is a flow chart showing the process sequence for an event generated in the device monitor server 203a.

In case any event is generated, the generated event is analyzed (step S601), and, if it is a
15 warning from a device and exceeds a predetermined threshold value (Yes in a step S602), the log data accumulated up to this point are acquired to prepare a message for requesting log data process (S602) and a log process request is issued to the device center
20 server 210. If the event does not exceed the threshold value, it is accumulated in the log.

On the other hand, if the event is not a warning, it is regarded as an error in the present embodiment and a message indicating a trouble event is prepared
25 (S605) and is transmitted to the device center server 210 (S604).

The trouble event in the device monitor server

203a also includes the absence of expendables such as toner, ink, paper etc. used in each device, and, in such case, the present invention is also capable of executing a program process for inventory monitoring in addition to the processes of preparing the event message (S605) and memorizing the log for absence of expendable. Such process is similarly executed also in the trouble information to the PC client module 203d of PC/server type, and trouble information between the device and the device monitor server in a second embodiment. The details of such process will be explained later.

Fig. 7 is a flow chart showing of the process of the device monitor server 203a for receiving a message from the device center server 210.

At first there is discriminated whether the received message is a set value download request (step S701). If so, setting is executed between the device monitor server 203a and the device based on the received set value data (S702). The base plug-in 203b deletes such data (S703) and issues a response message indicating the completion of downloading to the device center server 210 (S704). The base plug-in 203b is required to be connected to the device monitor server 203a only logically and may be physically separated if such logic connection is made.

If the message is not a downloading, there is

discriminated whether it is a device information
collection request (S706), and, if so, the
information is collected from the designated device
(S707) and the device information is transmitted to
5 the device center server (S708).

The above-described procedure allows unified
management in the managing site on the trouble event
in the managing system for the general-purpose
computer and in the managing system for the
10 peripheral devices as integrated information. Also
the present invention is not limited to a case in
which the managing information for the device is
adapted to the managing software of the PC/server,
but is also applicable to a case in which the
15 managing information of the PC/server is adapted to
the managing software of the device. For example the
event adaptor 210a shown in Fig. 2 may be provided in
the center server 110 thereby informing the device
center server 210 of the event generated in the
20 device server. Also in still another embodiment,
there may be provided an event adaptor 210a for the
equipment of device type corresponding to the device
center server and an event adaptor 210a for the
equipment of PC/server type corresponding to the
25 center server 110, and the format information (first
format) specific to the equipment of device type
collected by the device center server 210 and the

format (second format) specific to the equipment of
PC/server type collected by the center server 110 may
be managed in unified manner in a common format
(third format) other than the format specific to the
5 equipment of device type and that specific to the
equipment of PC/server type. It is thus rendered
possible to manage the equipment of device type and
the equipment of PC/server type in respective
specific formats (formats corresponding to the
10 management systems) and to manage both in unified
manner from a remote location.

It is also possible to use a same channel for
the channel connecting the device monitor server 203a
and the device center server 201 and for the channel
15 connecting the PC monitor client 203d and the center
server 110 and to utilize a router etc. in common,
thereby reducing the number of channels. Such
configuration is effective in case an exclusive line
is used for the channel.

20 (Second embodiment of management system)

In the following there will be explained a
second management system of the present invention
with reference to the accompanying drawings. The
system of the present embodiment is different from
25 the first management system in the configuration of
the logic channel between the managing site and the
managed site. In the first management system, though

it is possible to use the communication line in common, the channel connecting the device monitor server 203a and the device center server 210 and the channel connecting the PC monitor client 203d and the center server 110 are mutually independent logically. In case the device center server 210 receives a trouble event from the device monitor server 203a, an event informing the generation of trouble is transmitted to the center server 110 thereby achieving unified management of the trouble event in the event monitor.

On the other hand, the present system dispenses with the device center server 210 and the channel connecting the device monitor server 203a and the device center server 201. The device center server is replaced by a device information processing module 901, provided in the center server 110 (separately illustrated), for processing the information of the devices received by the center server 110. In such configuration, in case there are employed a PC monitor client 203d and a center server 110 which are commercially available, the message of the devices is also supplied to the channel established therebetween. In this manner, there is obtained, in addition to the advantage of the first embodiment allowing to use the channel in common, an advantage not requiring an independent communication channel for the information

of the devices, and also not requiring the device center server.

<System configuration>

Fig. 9 is a block diagram showing the configuration of the software module in the management system of the present embodiment. A user base system (indicating the managed site) is provided in mixed manner with equipment of device type (peripheral devices such as printer, copying apparatus, scanner, facsimile, compound device etc.) and equipment of PC/server type (general-purpose computer), and the equipment of PC/server type is managed by the PC monitor client 203d as in the first embodiment of the management system. Also the configuration of the equipment of PC/server type and that of device type is similar to that explained in the first embodiment and will not, therefore, be explained further.

The center system (indicating the managing site) includes a device information processing module 901 for data exchange with the device monitor server 203a, and a center server 110 for data exchange with the PC monitor client 203d. The management information of the equipment of device type and PPC/server type is accumulated in the inventory database 109. There is shown only one database in Fig. 9, but it is required to be separated into databases of device type and

PC/server type. This information is utilized for example by the application system 205, the center server 110 etc. as in the first embodiment.

The managing site and the managed site are
5 connected by a channel which is connected by routers 204. The PC monitor client 203d and the center server 110 can be realized by a commercially available site management system. All the messages are provided by such commercially available
10 management system, and are transmitted and received by the channel constituted by the PC monitor client 203d and the center server 110. In Fig. 9, the device information processing module 901 is independently provided (corresponding to the device
15 center server 210 in Fig. 2), but such function may also be incorporated in the center server 110.

The device monitor server 203a and the PC monitor client 203d are connected through a base plug-in module 203b for converting the data format
20 and the protocol whenever required. Thus, the base plug-in module 203b has a function of converting the information of the device monitor server into the format (or protocol) of the PC monitor client 203a and an inverse converting function. It is also
25 possible to provide the plug-in of center side (corresponding to the server plug-in in Fig. 2) for data exchange between the center server 110 and the

device processing module 901 with functions
equivalent to those of the base plug-in module 203b.

The base plug-in module 203b has functions, as
will be explained later, of transferring the message
5 from the device monitor server 203a to the PC monitor
client 203d for transmission to a designated
destination, searching by periodical polling the
content of a predetermined data area written by the
PC monitor client 203d and transferring, to the
10 device monitor server 203a, any message addressed
thereto.

Also the center server 110 transfers the
received message, according to the content thereof,
to the device information processing module for
15 processing if the content is information relating to
the device or to the event monitor 110a, if the
message informs generation of an event, for
displaying the generated event in the event list in a
display form capable of identifying whether the event
20 relates to the device type or the PC/server type.
The event of the device type is issued from the
device information processing module 901.

As explained in the foregoing, the presence of a
plug-in having the format converting function between
25 the device type and the PC/server type allows to
utilize the functions of the commercially available
management software for the PC/server type and

enables exchange of the information of the device type between the base side and the management center side. Also the information specific to the device, that cannot be managed in detail by the commercially available management software for the PC/server type can be processed by the device information processing module after converting the data relating to the content of the device transmitted from the center side, from the format of the PC/server type into the format of the device type. If detailed management is desired for the device information, it is only required to independently develop the device information processing module and the efficiency of development/designing can be improved.

In the following there will be explained, with reference to Figs. 10 to 12, the message exchange procedure between the base system (managed site) and the center system (managing site), by three examples, i.e. (1) downloading of set value from the device center server 210 to a device, (2) uploading of log data from the device monitor server 203a to the device center server 210, and (3) request for counter data from the device center server 210 to the device monitor server 203a.

<Procedure of set value downloading>

Fig. 10 is a block diagram showing the data exchange sequence between the base system and the

center system. The downloading of a set value is executed in the following manner.

At first in the application system 205, the designation of a device to be set and the set value
5 are manually entered to prepare a set value information file 1002:

- (1) The application system 205 establishes a session with the center server 110;
- (2) The center server 110 activates a distribution
10 module 1001 and prepares a distribution file package 1001a from the set value information file 1002;
- (3) The distribution module 1001a transmits the distribution package file to the PC monitor client 203d for storage therein as a work file;
- 15 (4) The base plug-in 203b periodically monitors the data file stored by the PC monitor client 203d, and, detecting the preparation of the work file by the PC monitor client, informs the device monitor server of the arrival of the set value and transfers the set
20 value data to the device monitor server 203a. The device monitor server 203a sets the set value in the designated device;
- (4-2) The base plug-in 203b informs the center server, through the PC monitor client 203d, of the completion
25 of setting;
- (5) The center server 110 causes the distribution module 1001 to delete the distribution package file

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1001a;

(6) The center server 110 informs the application system 205 of the completion of setting.

As explained in the foregoing, the set
5 information of the device can be downloaded to the device by transferring the set data to the device monitor server 203a.

A trouble generated in the device type is transmitted, in the same manner as in the above-
10 described sequence (4-2), as a trouble event from the base plug-in 203b to the center server 110 through the PC monitor client 203d. Thus the event informing the trouble is processed by the event monitor 110a of the center server 110 and is displayed in the event
15 list.

<Procedure of counter uploading>

Fig. 11 is a flow chart showing the procedure of uploading of the count data, namely the device information collection, executed between the base
20 system and the center system. The uploading of the device information is executed in the following manner:

(1) The application system 205 stores the information request command in a file and issues a
25 message (event) initiating the information collection to the center server 110;

(2) The event monitor analyzes the event from the

application system 205 and activates the distribution module 1001 thereby preparing a distribution file package 1001a for the information request command;

(3) The center server 110 transmits a distribution package, including the prepared information request command, to the PC monitor client 203d, which stores the received file as a work file. Such work file constitutes a general-purpose file in the PC/server management system and corresponds to the content of the distribution file package 1001a;

(4) Upon detecting that the file is stored by the PC monitor server 203d, the base plug-in 203b calls and transfers the file to the device monitor server 203a. In response, the device monitor server 203a collects the device information from the designated device and transfers it to the base plug-in 203d;

(5) The base plug-in 203b stores the received device information as a file 203e of a predetermined format. In the present embodiment, such predetermined format is assumed as MIF format, which is a general file format in the information management system;

(6) The base plug-in 203b deletes the work file;

(7) The base plug-in prepares an event indicating the preparation of an MIF file and transmits it to the center server 110;

(8) Receiving the event, the center server 110 deletes the distribution file package;

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- (9) If the event received from the base plug-in 203b indicates the completion of proper information collection, the center server 110 also activates a common information collection module 1102 for reading
5 the MIF file prepared by the base plug-in and collecting the device information;
- (10) The common information collection module 1102 reads the MIF file 203e thereby acquiring the collected device information;
- 10 (11) The common information collection module 1102 stores the acquired device information in the inventory database. The inventory database includes databases logically or physically separate for the equipment of device type and that of PC/server type,
15 thereby being capable of flexible process according to the object equipment;
- (12) The center server causes the MIF file 203e of the base side to be deleted;
- (13) Completion of the process is informed to the
20 application.

As explained in the foregoing, the center server 110 can acquire the device information collected by the device monitor server 203a.

<Procedure of log data uploading>

- 25 Fig. 12 is a flow chart showing the procedure of log data uploading from the base system to the center system. The uploading of the log data in the present

embodiment is executed in the following manner:

- (1) The device monitor server 203a issues, to the base plug-in 203b, an information indicating the detection of an error or a warning and that the number thereof exceeds a threshold value;
- (2) The device monitor server 203a issues event data of the aforementioned warning to the base plug-in 203d;
- (3) The base plug-in 203b stores the log data as a file 203e of MIF format, which is a general file/data format in the information management system as explained in the foregoing;
- (4) The base plug-in 203b prepares an event indicating the preparation of the MIF file and transmits it to the center server 110;
- (5) Receiving the event, the center server 110 activates the common information collection module 1201;
- (6) The common information collection module 1102 fetches the MIF file prepared by the base plug-in 203b and reads the log file;
- (7) The common information collection module 1102 stores the acquired device information in the inventory database 109;
- (8) The center server causes the MIF file 203e of the base side to be deleted;
- (9) Completion of the process is informed to the

application.

As explained in the foregoing, the center server 110 can acquire the log data file prepared by the device monitor server 203a.

5 <Process sequence by device center server>

In the following there will be briefly explained the process sequence by the center server 110, the device information collection module 901, the base plug-in 203b and the PC monitor client 203d. Fig. 13
10 is a flow chart showing the process sequence of the center server 110 at the event reception. The process shown in Fig. 13 is initiated in response to the reception of an event. In the following description, message and event are not rigorously
15 separated, and the event is used to indicate a message informing the generation of an event.

At first the received event is analyzed (step S1301) to identify the source of issuance (S1302). If the source of issuance is the PC monitor client
20 203d, the event is processed by the event monitor, and, if it is a trouble event, it is displayed in the event list (S1303).

Then there is discriminated whether the event is of the device type, namely issued from the base plug-in 203b (S1304), and, if so, each event is processed
25 by the device information processing module. This procedure is shown in Figs. 14 to 16. If the event

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is not of the device type, the center server 110 executes a process corresponding to the event.

On the other hand, if the source of issuance of the event is the backend, namely the application system, there is discriminated whether the event is for executing information collection (S1305), and, if so, an information collection request is issued to the base plug-in module 203b (S1309). The information collection request is executed by causing the distribution module 1001 to prepare and distribute a distribution file package.

If the event is not an information collection request, there is discriminated whether the event is for requesting downloading (S1306). If not, there is executed a process corresponding to the event, and the sequence enters a waiting state for the event.

If the event is for requesting downloading, the data to be downloaded are acquired from the backend (S1307) and are distributed to the base plug-in 203b (S1308).

<Process sequence by device information processing module>

The event identified as of the device type in the step S1304 in Fig. 13 is further analyzed into (1) an event indicating the end of downloading, (2) an event informing the end of device information collection, or (3) an event requesting log data

uploading. These cases respectively correspond to the flow charts shown in Figs. 14 to 16.

(End of downloading)

Fig. 14 is a flow chart showing the process sequence for a downloading end event by the device information processing module 901. When the end of downloading is informed, at first the distribution file package 1001a is deleted (step S1401), and the end of downloading is informed to the backend (S1402).

10 (Acquisition of device information)

Fig. 15 is a flow chart showing the process sequence for information of the device information acquisition (counter uploading) by the device information processing module 901.

15 At first the distribution file package 1001a prepared for the information collection request is deleted (step S1501). Then, if the data acquisition is executed properly (S1502), the information collection module 1101 is activated (S1503) to request, to the device monitor server 203a, the MIF file storing the device information, and the MIF file is received in response (S1504).

20

Then the received file is stored in the inventory database 109 (S1505), and the deletion of the MIF file is requested to the device management server 203a (S1506). Finally, the end of the device information collection is informed to the backend

25

(S1507).

On the other hand, if the step S1502 identifies that the data acquisition is not properly executed, such fact is informed to the backend (S1508).

5 As explained in the foregoing, the device information prepared as the MIF file is acquired from the device management server 203a.
(Uploading of log data)

Fig. 16 is a flow chart showing the process
10 sequence for the information of log data uploading, by the device information processing module 901.

In response to an information for log data uploading, the common information processing module 1201 is activated (step S1601) and a request for
15 transmission of the MIF file including the log data is issued to the device monitor module 203a (S1602).

Then the MIF file is received as a response (S1603), and is stored in the inventory database 109 (S1604). Then there is issued a deletion request for
20 the MIF file to the device monitor server 203a (S1605), and, upon completion of these processes, the end of process is informed to the backend (S1606).

<Process sequence by device monitor server>

Fig. 17 is a flow chart showing the process
25 sequence of the base plug-in 203b for a message or an event issued to the plug-in. The message issued from the center server 110 to the base plug-in 203b is

stored by the monitor client 203d in a predetermined area, and the base plug-in 203b monitors such message either constantly or periodically.

When a message is found, there is discriminated
5 whether the message is from the device monitor server 203a (step S1701), and, if so, the message is analyzed (S1702). If the message is a warning or exceeds a threshold value, the log data are prepared as an MIF file and an event informing the log data
10 uploading is issued to the center server 110 through the PC monitor client 203d (S1705).

If the message is not a warning nor exceeds the threshold value, there is discriminated whether the message indicates an error (S1706), and, in case of
15 an error, there is prepared a message indicating a trouble event and the sequence branches to a step S1705 (S1707).

If the message is not from the device monitor server 203a, the message is judged as from the center
20 server 110 and the data of a predetermined area written by the PC monitor client 203d are read (S1708) and analyzed to execute a process matching the content thereof. Fig. 18 shows the details of the process matching the analyzed content.

25 Fig. 18 is a flow chart showing the process sequence by the base plug-in 203b according to the message received from the center server 110.

At first there is discriminated whether the message is download data (step S1801), and, if so, the reception of the download data is informed to the device monitor server 203a (S1802), and the data are transferred thereto (S1803). Then the transferred data are deleted (S1804), and a download completion event is issued to the center server (S1805).

If the message is not download data, there is discriminated whether the message is a device information collection request (S1806), and, if so, the collection of the device information is requested to the device monitor server (S1807).

When the device information is received from the device monitor server 203a in response (S1808), the information is stored as an MIF file (S1809), and a message indicating that the device information is collected is issued to the center server 110.

<Process sequence by PC monitor client>

Fig. 19 is a flow chart showing the process sequence in case the PC monitor client receives a message.

Referring to Fig. 19, the destination of the received data is discriminated (step S1901), and, if addressed to a general-purpose computer such as PC/server, the data are transferred to the designated process (S1902), but, if addressed to the base plug-in, the data are written into the aforementioned

predetermined area.

As explained in the foregoing, the system of the present embodiment can utilize a monitor system for a general-purpose computer for managing a peripheral
5 device, provided in a managed site same as that of the general-purpose computer to be monitored. Thus, at the managing site, the general-purpose computer and the peripheral device can be monitored by a same method in a unified manner. Also the collection of
10 information and the setting of a parameter on the peripheral device can be achieved from the managing site through the monitoring system. Also the log data can be transmitted from the managed site to the managing site.

Also in the monitor system for the general-
15 purpose computer, the modules to be added for managing the peripheral device can all be realized by softwares, so that no hardware is required for this purpose and there can be prevented the increase in
20 the magnitude of hardware such as the installation area, equipment cost and maintenance works.

Also the present invention is not limited to a configuration of adapting the management information of the device type to the management software of the
25 general-purpose computer (PC/server), but is likewise applicable to a configuration of adapting the management information of the general-purpose

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computer (PC/server) to the management software of the peripheral device.

(Third embodiment of management system)

In the following there will be explained a
5 management system for the service and expendables in which the management systems of the first and second embodiments are applied.

Fig. 20 shows the details of the base system and the center system shown in Fig. 2. At first there
10 will be given an explanation on the user base system 2001.

The copying apparatuses A 2004 and B 2007 indicate models or types thereof. Also for the printer, personal computer or server, A and B
15 indicate models or types thereof. A manager PC 2016 manages the equipment of PC/server type such as a server A or personal computer A and the equipment of device type such as the printer A, connected on a network 2017. The objects of the present invention
20 can be attained if the servers A and B have respective logical functions even in case they are physically realized by a single apparatus.

The manager PC 2016 also executes information exchange with the servers A, B. The detailed
25 configuration of the equipment such as the manager PC, the personal computer A, the server A etc. is same as that shown in Fig. 3, but there is also provided

detection means for detecting that the capacity of HD is full and requires addition.

The network 2017 indicates a network such as LAN, but the present invention is naturally applicable
5 also to a configuration in which the equipment of PC/server type and the peripheral devices thereof are connected through wireless communication such as infrared communication or bluetooth. In case such wireless communication is applied, a LAN controller 8
10 shown in Fig. 34 also serves as a wireless communication control unit. Also in such case, the equipment of device type such as the printer A is to be provided with a wireless communicating function.

The user base system 2001 corresponds to the
15 user base system shown in Fig. 2; the network 2002 to the network shown in Fig. 2; the center system 2003 to the center system shown in Fig. 2; the copying apparatus A, the printer A etc. to the equipment of device type in Fig. 2; the personal computer, the
20 manager PC etc. to the equipment of PC/server type; the server A to the device monitor server 203a in Fig. 2; and the server B to the PC monitor client module 203d in Fig. 2. Also other components corresponding to Fig. 2 and not shown in Fig. 20 will not be
25 explained further but are assumed to be present in the following description.

Also, as explained in the network 2017, a

network 2002 connects the user base system 2001, the
center system 2003, a financing organization 2023, a
distribution organization 2024 by wired or wireless
communication. The financing organization or the
5 distribution organization indicates an information
processing apparatus provided in each organization.

Also, through not illustrated, the equipment of
device type such as the copying apparatus A, B or the
printer B is provided with functions of print
10 controller, network communication, and error
detection in HD or for absence of expendables, but
the details will not be explained since they are
based on the known technologies. Also the equipment
of PC/server type such as the personal computer A is
15 provided with a memory (including RAM or HD), and in
case of a notebook PC, there is provided an error
detection sensor for detecting an error in the
expendable such as the battery.

In case an error is detected in either of the
20 equipment of device type and that of PC/server type
and the corresponding information (including the
absence of expendable) is informed to the servers A,
B, there is added device specifying information for
specifying the own device (device emitting the
25 information) to the error information. Such device
specifying information is stored in an internal
memory of each device. A machine number/serial

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number, a MAC address or an IP address corresponds to such information. Also the expendable type number of the expendable, stored in a non-volatile memory provided in the expendable can also serve as the device specifying information. The server A or B, receiving such device specifying information, is provided in a memory with a database capable of specifying the type of the device or the expendable from the expendable type number. Through the comparison of such database with the device specifying number or the expendable type number, it is rendered possible to recognize the equipment, among those of device type and PC/server type, in which the expendable is consumed. Fig. 23 shows an example of the database, of which details will be explained later. Also the procedure of communication has been explained in the foregoing and will not be explained further.

In the following there will be explained the center system 2003, for executing the maintenance management etc. of the user based on the information transmitted from the user base system. A center server 2018 executes collection/management of the information on the devices of the user side. A center server 2020 executes collection/management of the information on the PC/server of the user base side. The information relating thereto is stored and

managed in an inventory database 2021.

An application system 2022 and a backbone system 2025 are provided with a function of executing dispatch of a service personnel etc. based on the information collected by the device center server 2018 and the center server 2020.

The backbone system 2025 also has a function as the information window for the center system 2003, the financing organization 2023 and the distribution organization 2024.

In Fig. 20, the device center server, the center server, the inventory database, the application system and the organization system are illustrated to be in a same site, but the objects of the present invention can be attained as long as they are logically unified even if they are composed of physically separate apparatuses or are located in different sites and mutually connected by a network.

A device center server 2018, an event adaptor 2019, a center server 2020, an inventory database 2021 and an application system 2022 respectively correspond to the device center server 210, the event adaptor 210a, the center server 110, the inventory database 109 and the application system 205 in Fig. 2.

The financing organization 2023 is provided with a function of exchanging monetary information with the user base system 2001n and the center system 2003.

The information representing money can be, for example, electronic money. Also the distribution organization 2024 has the function of distribution with the user base system 2001 and the center system 5 2003 and is bidirectionally connected thereto with respective networks.

In the following there will be given an explanation on Fig. 21. The user base system, center system, financing organization and distribution 10 organization are same as those shown in Fig. 20 and will not be explained further.

At first a step S2101 informs the server A or B at the user base system of an information signal indicating the absence of expendable, detected by the 15 equipment of device type or that of PC/server type provided in the user base system. The information is executed by a device such as the printer provided in the user base system, for the expendable corresponding to the device. As explained in the 20 foregoing, the servers A, B respectively correspond to the device monitor server 203a and the PC monitor client module in Fig. 2.

In a step S2102, the server A or B receiving the aforementioned signal specifies the device informing 25 the absence of expendable based on the received information, and specifies the model/type of the expendable used in thus specified device, utilizing

In a step S2103, the inventory amount of the model/type of the specified expendable is managed by referring to the database of own or another device.

5 More specifically, the inventory information in the database is referred to, then the inventory number is subtracted from the referred inventory amount and the result of subtraction is stored again in the database. A signal indicating the absence of expendable is once
10 outputted from a specified device, the same signal is not repeatedly outputted until expendable replacement detection means provided in the equipment of device type or PC/server type detects the replacement by a new expendable. The expendable replacement detection
15 means is capable of recognizing the replacement of the expendable by detecting, for example, the change in the inventory amount of the expendable. More specifically, when the expendable absence signal changes from an empty state (called low level state)
20 to a state of a sufficient remaining amount (called high level state), the expendable replacement detection means is shifted from a low level state to a high level state and recognizes the mounting of a new expendable to the image forming apparatus when
25 the high level state continues for a sufficiently long period. Naturally the expendable replacement detection means is not limited to such type but can

be based on various systems. Also there can be conceived a configuration in which the error information generated in the equipment of device type such as the printer in the user base system, the
5 information indicating the working status such as the absence of expendable or the number of printer, and the information generated in the equipment of PC/server type such as the personal computer or the server are collectively managed in the service center.

10 A step S2104 discriminates whether the result of subtraction is less than a predetermined lower limit of the inventory, and, if not, the sequence enters a waiting state for the information on the absence of expendable or an ordinary sequence for executing
15 another process (S2105).

The aforementioned steps S2101, S2103 and S2104 have been explained to be executed in the server A or B in the user base system, but they may also be executed in the center system. Such configuration
20 can be realized, for example, by the expendable absence signal from the device of the user base system to the center system 2003 through the network.

In case the result of discrimination in S2104 is less than the predetermined value, order information
25 is automatically informed to the center system 2003 (S2106). Instead of automatically sending the order information to the center system, it is also possible

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5 from the manager PC. In the present invention, it is also possible to execute the informing to the center system after an instruction by the customer for the ordering, as will be explained later in more details.

A step S2107 searches the customer based on the
15 customer information included in the order
information received by the process of the step S2106.
The search of the customer information is executed by
referring to a customer database stored in the device
center server 2018 or the application system 2022 of
20 the center system 2003 shown in Fig. 20.

A step S2109 executes delivery of the merchandise from the distribution organization 2024,

and a step S2110 executes information for the delivery in S2109. The step S2110 informs the distribution organization of the number/type of the actually delivered merchandise on site by the service
5 personnel, utilizing a device such as the portable terminal thereof. In the present invention, the information may also be executed for example from the manager PC.

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In a step S2111, the type/number of the
10 merchandise actually delivered from the distribution organization 2024 to the user base system 2001 is informed therefrom. More specifically, the type/number of the merchandise actually delivered in S2109 is informed in the user base side, based on the
15 input in the input unit such as the keyboard of the server A 2011 or the manager PC 2016. This information is utilized in comparing the information of the type/number of the actually delivered merchandise informed from the distribution
20 organization 2024 to the center system 2003 (S2201 in Fig. 22) and the information from the user base system 2001 (S2111 in Fig. 21). In this manner the center system 2023 can manage the delivery information and the inventory information at the user
25 base in more exact manner.

A step S2112 requests recovery of the expendable. The recovery request may also be once sent to the

center system and then informed to the distribution organization. Then the used expendable is recovered by the service personnel of the distribution organization. The operation of S2111 may be executed
5 at the timing of delivery or at another timing.

In the following there will be explained the process shown in Fig. 22 which is the continuation of that shown in Fig. 21. In Fig. 22, A, B and C respectively correspond to A (user base system), B
10 (center system side) and C (distribution organization) in Fig. 21.

A step S2202 transmits, to the user base system, an electronic bill generated in the center system based on the information received in S2201 and S2111.
15 The electronic bill is received by the server A or B, and an electronic mail indicating the arrival is informed to the manager PC.

In the present invention, it is also possible to execute such informing by uploading the electronic
20 bill to a server provided on the internet. In such case, the content of the electronic bill on the internet can be viewed by sending a password to the manager PC of the user base system.

A step S2203 generates information whether the
25 user approves or not the informed electronic bill. The information relating to the approval includes user ID information for specifying the user and a

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If the approval in S2203 is refused, a step S2204 informs the center system of the refusal from the web browser in S2203. The informing sequence will be explained later.

10 A step S2207 transmits, to the financing
organization, an extracting command from the customer
account based on the account information specified by
the search in S2206, and a step S2208 enters the
electronic money into the center system. There may
15 also be considered ordinary payment by cash.

Fig. 23 shows an example of the management database for managing the equipment of device type and PC/server type owned by the user, and the expendable used therein. The information of the database is stored in the server A 2011 of the user base system or any device in the center system.

A column 2301 indicates the number/serial number of the installed equipment. A column 2302 indicates a MAC (media access control) address. A column 2303 indicates an IP (internet protocol) address. A column 2304 indicates the ID of the expendable, enabling to identify the type of the expendable. A

column 2305 indicates the date of the second latest replacement of the expendable, for each equipment. A column 2306 indicates the date of the latest replacement of the expendable for each equipment. A

5 column 2307 indicates the anticipated date of next replacement, calculated and displayed from the past replacement history of the user for the expendable and from the use rate of the currently used expendable. These data are processed by a program

10 installed in the manager PC or a program stored in the server A. The display in the column 2307 may also be displayed in the form of "X days to go", namely by the remaining number of days to the anticipated date of next ordering.

15 Fig. 24 shows a database stored in the server A or in any device of the center system, as in Fig. 23. A column 2401 indicates the type of expendable, and a column 2402 indicates the inventory amount of each expendable. A column 2403 indicates the order

20 threshold value, under which the ordering becomes necessary. This threshold value may be set as a default value by the service provider or may be set for each expendable by the user. The setting can be achieved by displaying the data of Fig. 24 and

25 executing entry in a column with an input device such as a keyboard or a mouse. The threshold value thus entered is memorized as the set value.

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A column 2404 indicates an order unit, namely the number of expendables that can be ordered at a time. The information indicating the order unit may also be set by the user as in the data in the column 2403. A column 2405 indicates the inventory status and the user can recognize the inventory status of each expendable by watching this column. In this column, a text "stock OK" means that the inventory is so sufficient as not requiring the ordering, and a text "order next" means that the inventory still has a certain margin. Also a text "order" means that the ordering is necessary. Such plural inventory levels allows the manager to execute more detailed inventory management, and there can be achieved reduction of inventory since the ordering can be executed at different timing for each type of the expendable. It is also possible to obtain a demand estimate for the expendables for each user or for a group of plural users by receiving and managing, at the center server 2003, the information of each user as shown in Figs. 23 and 24.

Fig. 25 shows the history on the bills, in which, for each bill number shown in a column 2501, there are shown a billing date (2502), a history of approval/non-approval (2503), a date of approval (2504) and a reason of disapproval in case of disapproval (2505). This database is also stored in

the server A as in the databases in Figs. 23 and 24.

Fig. 26 shows an example of the display on the manager PC, for informing that the inventory of expendable has decreased. There will be explained
5 the sequence for displaying such image. When the inventory amount decreases to the order threshold value 2403 shown in Fig. 24, the server A provided with the database for Fig. 24 transmits a mail indicating such fact to the manager PC. A text "one
10 unit of expendable DDD-C remains in stock" is generated from the type of the expendable and the order threshold value corresponding to such type.

This image is displayed for each type of the expendable whereby the manager can recognize the
15 inventory amount or the absence of inventory for each expendable and can manage the individual ordering. Also an address '<http://rds/diag/consumable.html>' in the column 2604 indicates the URL storing the order sheet for the expendable. By designating such URL
20 with the pointing device such as a keyboard or a mouse, there can be viewed an image as shown in Fig. 27 on the manager PC by the web browser or the like. The display information that can be viewed by the web browser is stored for example in the HD of the server
25 A 2001 (corresponding to the HD storing the aforementioned databases). It may also be stored in memory means such as HD in any device of the center

system 2003.

It is also possible, in the present invention, to install in advance an exclusive application for enabling the manager PC to view the display image as shown in Fig. 27 and to cause the manager to activate such application and to actuate a "diagnosis button" displayed on the display image of such application, thereby displaying the image as shown in Fig. 27 at a timing desired by the manager.

Fig. 27 shows an order instructing image for the expendable, wherein a column indicates the type of the expendable. Columns 2702 to 2704 correspond to those 2402 to 2405 in Fig. 24 and will not be explained further. A selection button 2706 for ordering is not actuated for the item already ordered or having a sufficient inventory, or is rendered inactive for the selection by the pointing device.

By selecting the order button for each type of the expendable, there is ordered the expendable of the type corresponding to the selected ordering button.

A column 2707 indicates the type and the number of the expendable selected to be ordered by the button 2706, and displays the expendable of the type corresponding to the selection by the ordering button. The amount of order is determined by referring the database corresponding for example to Fig. 24 and is

automatically displayed. There may also be utilized an input by a pointing device such as a keyboard used by the user.

The depression of an OK button 2708 confirms the order. Also the depression of a button 2709 cancels the order whereby the display in the column 2707 is canceled.

The display shown in Fig. 27 allows the manager to easily execute the recognition of the inventory for each type of the expendable, thus far requiring cumbersome operations. Also the ordering can be executed at an appropriate timing for each type of the expendable, thereby minimizing the inventory of the expendable and reducing the space of inventory.

Fig. 28 shows a display generated by the server A based on bill data (Fig. 29) transmitted from the center system 2003 to the server A of the user base system. At first there will be given an explanation on Fig. 29.

Fig. 29 shows an example of the display of an approving image when the URL shown in 2804 is selected. Fig. 29 shows, in addition to the billed amounts, an approval button 2905, a disapproval button 2906 and an input column 2907 for entering a reason for disapproval in case of the disapproval. The approval or disapproval entered by the button 2905 or 2906 is informed to the server A or B and

then from the center A or B to the center system 2003.

The disapproval information is also utilized when the operator of the center server obtains confirmation of the disapproval from the user.

5 The information shown in Fig. 29 is generated by the center system when the order button 2708 in Fig. 27 is depressed and information indicating this fact is informed from the server A to the center system, and the generated information is transmitted from the center system to the server A of the user base system. 10 Such information is stored in the server A or in any device of the user base system, in order to avoid forging by the user.

Such information, transmitted from the center 15 system to the server A, includes mail generating information for generating, in the server A, a mail for informing the manager PC, from the server A, of the display information as shown in Fig. 28. Such mail generating information includes a number 20 assigned to each user, and a user management number assigned within the specified user. Fig. 28 shows an example of the display of such mail information to the manager PC.

In Fig. 28, a text 2804 25 'http://rds/diag/18790004.html' represents the URL for accessing to the approving image, and the user can shift to the approving image by selecting such

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URL. The information of the approving image is stored in the server A.

Within a text 2908 'No. 1879-0004' in Figs. 28 and 29, 'No. 1879' is a number assigned to each user
5 for user management, and '0004' is a management number in the specified user.

Fig. 30 shows an example of the bill image displayed on the manager PC when the approving button 2905 is selected in Fig. 29.

10 Fig. 31 shows an example of a disapproval confirming image displayed for confirmation on the manager PC when the disapproval button 2906 is selected in Fig. 29. This image allows to confirm the disapproval by the manager, in contrast to the
15 image to be displayed in case of approval in Fig. 29.

The images shown in Figs. 30 and 31 are generated and stored in the center system 2003 or the server A.

Fig. 32 is a view showing the flow of
20 information and merchandise among the financing organization 2023, distribution organization 2024, user base system 2001 and center system 2003 shown in Fig. 20. When an order instruction is informed from the user base system to a center system 3201
25 (corresponding to the center system 2003 in Fig. 20), a distribution instruction is transmitted from the center system 3201 to a distribution organization

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3202 (corresponding to the distribution organization
2024 in Fig. 20) (S3201). Receiving the distribution
instruction, the distribution organization 3202
executes the distribution and delivery of the
5 merchandise to a user base system 3203 (corresponding
to 2001 in Fig. 20) (S3202). When the delivery is
completed, the user base system 3203 transmits a
completion information to the distribution
organization 3202 (S3203). Receiving the completion
10 information, the distribution organization transmits
it to the center system 3201 (S3204). Receiving the
completion information, the center system 3201
transmits an inventory renewal command to the user
base system (S3205) and also transmits a bill issuing
15 command (S3206). A step S3207 transmits approval
information (approval or disapproval) based on the
bill issuing command in S3206 to the center system
3201. Receiving the approval information from the
user base system in S3206, the center system 3201
20 transmits sum collection requesting information to
the financing organization 3204 (S3208). When the
user instructs payment for example by electronic
money, a step S3209 executes collection of electronic
information such as electronic money (corresponding
25 to cash collection).

The system shown in Fig. 32 allows to reduce the
down time of the devices resulting from the absence

of inventory of the expendables.

(Fourth embodiment of management system)

In the following there will be explained a
fourth embodiment of the present invention, with
5 further details of the center system.

Figs. 33A and 33B show the process among the
user base system, the center system and the
distribution organization in the fourth embodiment.
The user base system corresponds to the device
10 monitor server 203a, the PC monitor client 203d or an
information processing apparatus having both
functions, while the center system corresponds to the
device center server 210, the center server 110 or an
information processing apparatus having both
15 functions. Also the distribution organization means
an information processing apparatus provided in the
distribution organization 2024 explained in the
foregoing embodiment. The process of each step is
executed by the information processing apparatus
20 constituting the main body of the process, and is
realized by a CPU (central processing unit) provided
in the information processing apparatus of the user
base system center system and distribution
organization by reading a control program stored in
25 non-volatile memory means such as a ROM or a hard
disk.

At first a step S3301 executes

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The step S3301 recognizes the object of the information received from the equipment of device type or PC/server type. If it is identified to be related with an inventory-related process, a step S3302 receives and recognizes expendable absence information including information which is informed from the equipment of device type, is related with the inventory and is at least capable of specifying the type of the expendable. The step S3302 is practically included in the step S3301 but is explained separately for the ease of understanding.

Then a step S3303 executes, based on the received information, a process for searching and specifying the device corresponding to type of the expendable which has become absent. The information 25 informed from the equipment of device type can be, for example, that explained in Fig. 23. It is thus

rendered possible to specify the type of the expendable which has become absent and the corresponding device in which the expendable has become absent.

- 5 Then a step S3304 executing a process of reducing the inventory number of the expendable, corresponding to a decrease of the invention of the expendable of the type specified in the step S3303. Then a step S3305 executes discrimination whether the
- 10 inventory number of the expendable of the type subjected to the process of the step S3304 has reached the threshold value or less. The processes of the steps S3304, S3305 at least includes those of the steps S2103, S2104 already explained in Fig. 21.
- 15 Then, in case the step S3305 identifies that the inventory number (amount) of the expendable of the object type has become equal to or less than the threshold value, a step S3306 generates order information at least including the type of the
- 20 expendable which has become absent and the user information allowing to specify the user and transmits such order information to the center system.

In the following there will be explained the process of a step S3308, corresponding to a center

25 system process. At first there is received, through a predetermined communication channel, information from the user base system (device monitor server 203a

and/or PC monitor client 203d).

Then a step S3309 discriminates whether the information received in the step S3308 is from an equipment of device type or that of PC/server type.

- 5 This discrimination can be achieved by the center system by referring to a bit flag indicating whether the received information relates to an equipment of the device type or an equipment of PC/server type.

- 10 In case the result of the step S3309 is Yes, namely in case the information received in the step S3308 is from an equipment of PC/server type, there is executed the aforementioned process corresponding to the equipment of PC/server type.

- 15 On the other hand, in case the result of the step S3309 is No, a step S3311 discriminates whether the information is inventory absence information for example by analyzing a bit information assigned to the received inventory absence information. The function of S3311 can also be realized by
- 20 discriminating, in the step S3309, whether the information received in the step S3308 relates to an equipment of PC/server type or the inventory management of the expendable. As explained in the foregoing, the present embodiment allows unified
- 25 management of the maintenance information on the equipment of PC/server type and the maintenance information on the equipment of device type, and

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There may also be received information on the
expendables in the equipment of PC/server type, and,

10 discrimination.

15 another process corresponding to the equipment of
device type. An example of such another process is
the transmission of setting information for
regulating the function of the printing apparatus. On
the other hand, in case the result of the step S3311

20 is Yes, a step S3313 searches the detailed
information of the customer (name and address of the
customer) in the customer information contained in
the order information and allowing to specify the
customer, and a step S3314 display, on the display
25 unit, the information relating to the absence of
expendable in correspondence with the searched
information relating to the customer. The display

5 34 shows the mode of display corresponding to the
step S3314.

10 A column 3401 indicates the date and time of
information of an event from the user base system to
the center system or of generation at the user base
system. A column 3402 'confirmation No.' corresponds
to an order management number to be explained later.
15 A column 3403 'e-Box No.' indicates identification
information of a monitor server (device monitor
server and/or PC monitor client module) installed in
the user base system, allowing to identify the device
monitor server and/or the PC monitor client module.
20 In case the user is large and is provided with plural
monitor servers, the information allows to specify
the monitor server of which the device or PC shows
trouble. A column 3404 shows the status of the
delivery process of a new expendable, in case an
25 order is instructed from the user for each absence of
inventory (corresponding to Yes in the step S3321).
This column is only changed by the turning-on of an

order flag in a step S3322 to be explained later, and the display is so controlled to show a text 3403 'unprocessed' in case the order flag is not turned on, and to show a text 3409 'undelivered' in case the
5 order flag is turned on but the new expendable is not yet delivered. In this manner the center system can execute unified management of the status of the services for the absence of inventory for plural users and plural equipment.

10 A column 3405 indicates an informing method corresponding to the process of a step S3316 to be explained later, and FAX communication or e-mail can be selected. A button 3407 executes the informing process according to the informing method selected by
15 the column 3405, and corresponds to the process of a step S3316 to be explained later. A button 3406 is to shift to an image for editing the content of a confirmation mail corresponding to the process of the step S3316. When an instruction signal is entered by
20 the button 3406 in a state where an event corresponding to 'e-Box No.' is selected from the displayed list, there are searched and displayed data such as customer information, type and amount of expendable etc. stored in advance in the database and
25 corresponding to the selected 'e-Box No.', as shown in Fig. 35.

In Fig. 35, a column 3502 displays the customer

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information, and a column 3503 displays information indicating the type and order amount of the expendable. Such information indicates information based on the corresponding 'e-Box No.' and stored in advance in the database, but it is naturally possible also to change for example the order amount by an input from the operator. In response to the entry of an instruction signal by the button 3501, the display returns to a state shown in Fig. 34.

10 A button 3408 is used in searching the past event informed from the user base system to the center system. A button 3410 is used for switching the object of the event shown in Fig. 34. Selection of "service" causes display relating to a device
15 trouble such as paper jamming, and that of "separation" causes display of monitor information on the equipment of PC/server type independent from that on the equipment of device type. Also selection of "expendable" causes display of information on the
20 expendable inventory as shown in Fig. 34.

Again referring to the flow chart shown in Fig. 31, a step S3315 executes discrimination by the center system whether the order flag is on. The order flag corresponds at least to the order
25 management number (for example the confirmation number in Fig. 34 or data 3602 in Fig. 36), which corresponds to the type and order amount of the

Individually, such serial numbers may naturally be selected so as not to mutually overlap.

5 This order flag is to be turned "ON (ordered)"
in case the order confirmation from the customer is
recognized by the center system in a step S3321 to be
explained later, and the order flag is shifted to
information indicating the completion corresponding
10 to the order management number, in case the
merchandise is delivered by a distributing person or
a service personnel (for example corresponding to a
step S3324 to be explained later) and information
allowing recognition of the delivery is recognized by
15 the center system. By incorporating a system for
controlling the order flag into the center system,
there is enabled efficient management on whether the
ordering work is properly executed.

In case a step S3315 identifies 'Yes', the
20 sequence proceeds to a step S3321, but, in case of
'No', the sequence proceeds to a step S3318.

The result 'No' in the step S3315 occurs in case the order flag is turned 'ON' corresponding to the order management number through the step S3322 but the situation of no inventory is generated repeatedly because the merchandise is not yet delivered. The repeated generation of the situation of no inventory

corresponds to a situation where the amount of the
expendable of a certain type becomes lower than the
inventory threshold value (S3305) to cause
information from the user base system to the center
5 system but the amount of inventory is further reduced
to cause an information, indicating that the
inventory is less than the threshold value, is
transmitted again from the user base system to the
center system. Information indicating such situation
10 is informed through steps S3318, S3319 and S3320 to
an address (for example e-mail address) assigned to a
portable terminal of a person in charge (for example
a service personnel in charge or a distributing
person in charge), thereby requesting that the
15 service personnel executes delivery of the
merchandise and providing the user with a service
capable of securely preventing the absence of
inventory. Also, through not illustrated,
information is provided to the user receiving the
20 delivery in addition to the information in the step
S3320, so that the user need not contact the service
center or the like to expedite the delivery in case
the expendable to be delivered is not immediately
delivered for some reason, whereby the burden on the
25 user can be alleviated.

Fig. 36 shows the mode of display of warning
information, informed to the portable terminal owned

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by the service personnel (or an information processing apparatus installed in the base of the service personnel) through the processes of the steps S3318 to S3320. A text 3602 indicates the order management number and corresponds to the information managed in the database of the center system when the approval for the order by the customer is confirmed through the steps S3321 and S3322. Also a text 3603 indicates the content of order of the customer and indicates the URL for observing the order content information generated for each customer or each order and managed in the database of the center system. By designating the URL, the service personnel can confirm the content of the order of the customer on the portable terminal of the service personnel. The present invention also includes a configuration where the content of order and the customer information are originally included in the display shown in Fig. 36. In summary, the present invention is featured by a fact that a notice requesting the urgent delivery of the expendable of a type showing no inventory is informed by the center system to the person in charge of delivery (service personnel or distributing person in charge), in case the center system detects the absence of inventory, executes the corresponding order instruction and instructs the delivery of the expendable corresponding to the absence of inventory

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response to the confirmation mail (transmission history of the information indicating confirmation) transmitted in the step S3316 is received from the user base system. If a step S3315 identifies the presence of a confirmation mail, a step S3323 transmits an instruction for delivering the expendable of the type and amount included in the information from the user base system in the step S3321 to the distribution organization (information processing apparatus thereof) and the portable terminal owned by the person in charge (service personnel or distributing person in charge). In response, processes of steps S3324 to S3328 are executed thereafter. The processes of the steps S3319 to S3322 are identical with those of the steps S2109 to S3322 and will not, therefore, be explained further.

In another preferred embodiment, the processes of the steps S3315, S3318, S3319 and S3320 may be executed in the user base system after the step S3305 identifies 'Yes'. In such case, the turning 'ON' of the order flag in the step S3322 is informed to a server provided in the user base system (for example 203 in Fig. 1), which executes the processes corresponding to the steps S3315, S3318 and S3319 based on the informed information indicating that the order flag is 'ON'. It is assumed that the server of

the user side stores the information on the person in charge for executing the delivery or the destination of communication (for example e-mail address) to the center system. Also the information indicating that
5 the order flag is 'ON' includes at least information indicating the type of the expendable showing no inventory. Such execution of the processes of the steps S3315, S3318 and S3319 in the user base side provides an advantage of alleviating the process in
10 the center system.

(Other embodiments)

The objects of the present invention can also be attained in a case where a memory medium storing the program codes of a software realizing the functions
15 of the aforementioned embodiments is supplied to a system or an apparatus and a computer (or CPU or MPU) of such system or apparatus reads and executes the program codes stored in the memory medium.

In such case, the program codes themselves read
20 from the memory medium realize the novel functions of the present invention, and the memory medium storing the program codes constitutes the present invention.

Also the data of device information may be stored in an HDD incorporated in an image processing
25 apparatus or an image data developing apparatus, in an externally connected memory medium, or a server accessible from the image data developing apparatus.

Furthermore, the data of the device information may be arbitrarily set by the user.

The memory medium supplying the program codes can be, for example, a floppy disk, a hard disk, an
5 optical disk, a magnetooptical disk, a CD-ROM, a CD-R, a DVD-ROM, a magnetic tape, a non-volatile memory card or a ROM.

Further, the present invention includes not only a case where the computer executes the read program
10 codes thereby realizing functions of the aforementioned embodiments but also a case where an OS (operating system) or the like functioning on the computer executes all the actual processes or a part thereof under the instructions of the program codes
15 thereby realizing the functions of the aforementioned embodiments.

The present invention further includes a case where the program codes read from the memory medium are once stored in a function expansion board
20 inserted into the computer or a function expansion unit connected thereto and a CPU or the like provided in such function expansion board or function expansion unit executes all the actual processes or a part thereof under the instructions of the program
25 codes thereby realizing the functions of the aforementioned embodiments.

In case the present invention is applied to the

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aforementioned memory medium, the memory medium stores program codes corresponding to the aforementioned flow charts, display processes for the images and the various database processes.

5 As explained in the foregoing, in case equipment of plural types are used in an office or the like, the present invention enables management of inventory and ordering for each type of expendable for each type of equipment. It is therefore rendered possible
10 to confirm the inventory corresponding to the type of expendable for various equipment used in the office, and individual ordering is enabled to alleviate the burden of the manager in achieving detailed management.

15 Also, since ordering can be executed for each type of the expendable, the inventory and ordering can be made for the minimum necessary expendable without waste.

It is also rendered possible to achieve unified
20 management on the electronic equipment of two types, namely that of device type such as a printer connected as a peripheral device to the PC and that of PC/server type such as a personal computer, and to extract and appropriately manage the inventory of the
25 expendable used in the equipment of device type.

Furthermore, the present invention enables not only the ordering of the merchandises but also the

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service after ordering such as the delivery of the
new expendable in smooth manner.

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